TRB

Statewide Data and Information Systems Committee

Transportation Research Board

Data Perspectives on Critical Issues for Transportation

Statewide Data Views

presented by

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Outline

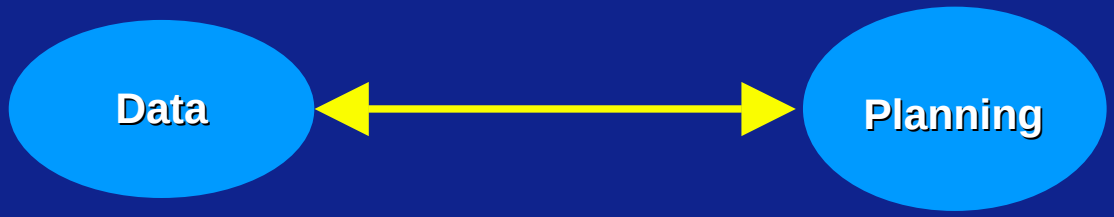
- Statewide Data Committee – Hot Issues
- TRB Critical Issues
- Statewide Data Perspectives on Critical Issues
  - Safety and Security
  - Environment
  - Congestion

Statewide Data and Information Systems Committee (A1D09)

- **WHO ARE WE?**
  - **20 members**
    - 8 State Departments of Transportation
    - 1 MPO
    - 4 Federal Government
    - 2 University
    - 3 Private Industry
    - 2 International

Statewide Data and Information Systems Committee (A1D09)

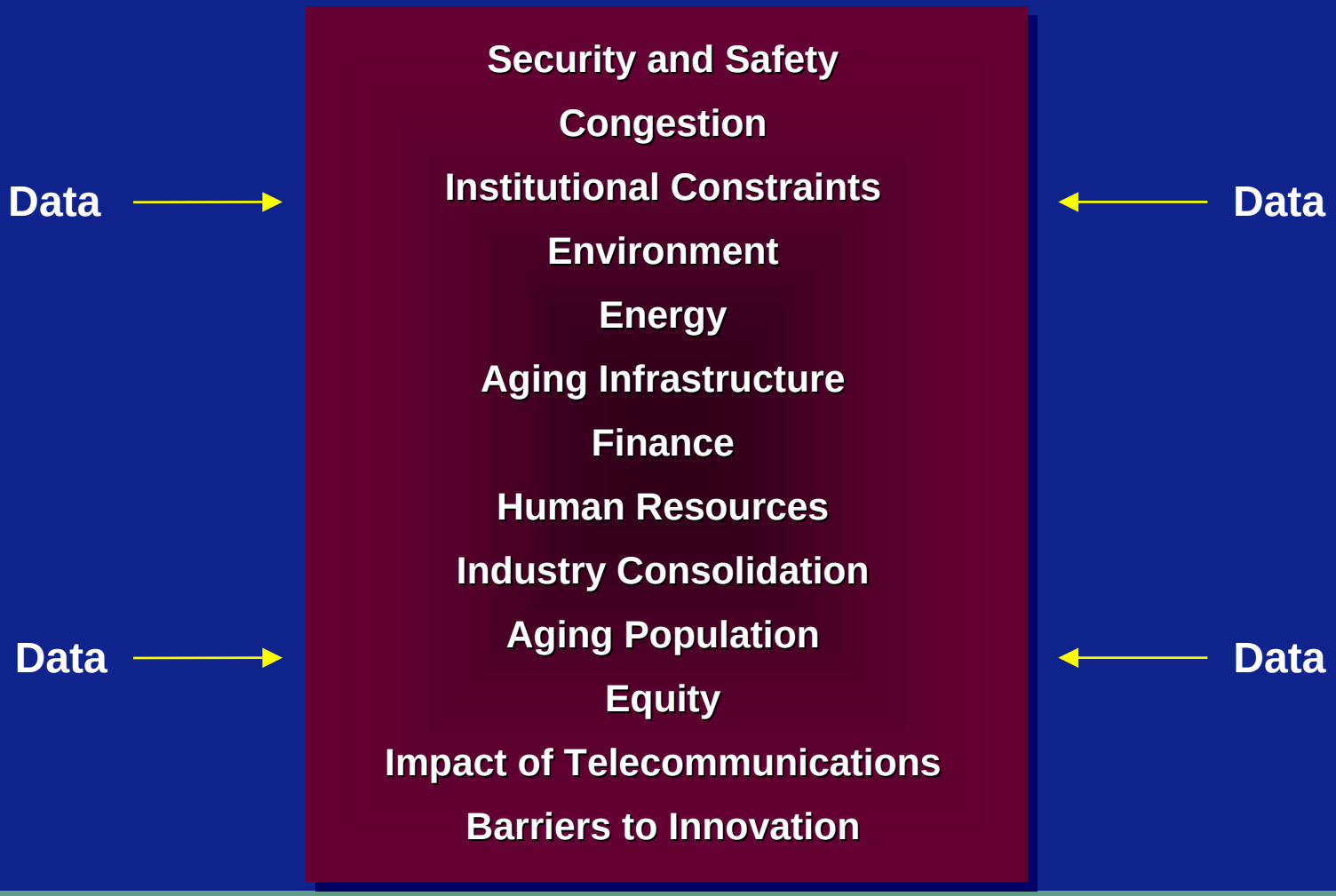
- **WHAT DO WE DO?**
  - **Mission**
    - Research and technology transfer
    - Statewide transportation planning data and information systems
    - All modes
    - Primary Concern = Integrating data into strategic multimodal databases for statewide transportation planning



Statewide Data and Information Systems Committee (A1D09) – Hot Issues

- Spatial Data – GIS, GPS, remote sensing
- Data for freight and performance measures
- Data and operations
- Data management and integration
- Use of census data
- Data accessibility, reliability, integrity, quality
- Data gaps discovered as a result of reauthorization

TRB Critical Issues in Transportation



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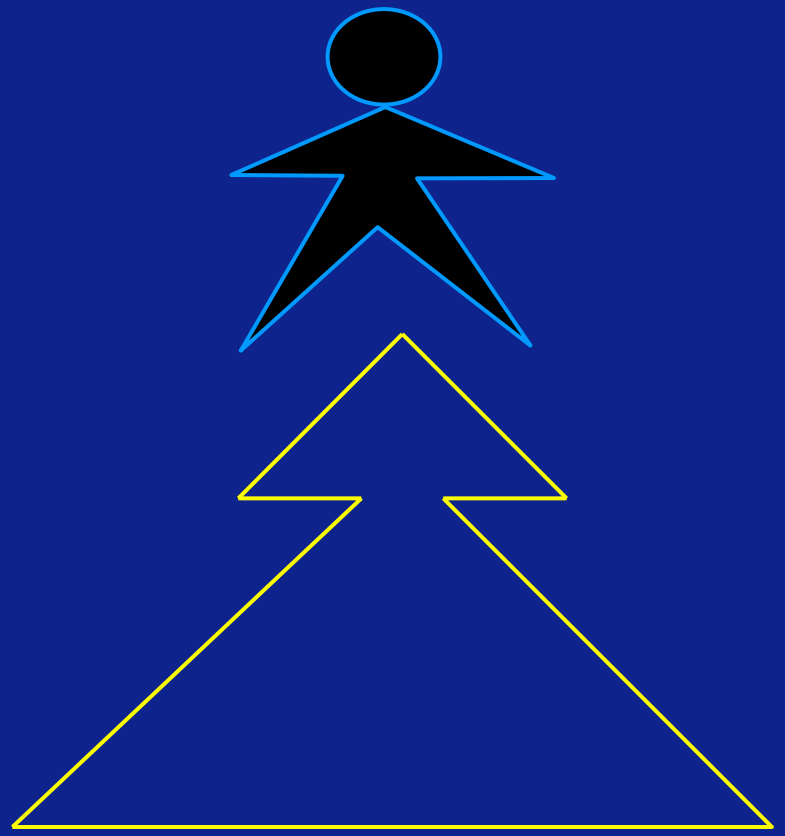
Most Critical Issues for Statewide Data Committee

- **Safety and Security**
- **Environment**
- **Mobility**



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Safety and Security

- Shared responsibility with Federal and local agencies
- Readily available data is necessary to assess need for safety improvements and security violations
- Data Types – fatalities, assets (railroad, road, and bridge inventories)
- Data from ITS
- Use of GIS, Spatial Data
- Data Integration is critical

Environment

- Environmental streamlining and increased concern with community impact assessment = need for efficiency
- Planning and environment needs drive data requirements
- "Partnering for the Development of Environmental Databases" (FHWA NEPA and TRB)
- Partnerships with resource agencies and non-governmental organizations to develop general-purpose data sources
  - For multiple transportation projects
  - For other uses

Environment
Example from Caltrans

- Caltrans working with Cal-EPA and California Resources Agency
  - Sharing and using information
  - To improve decision making
- Challenges = developing, maintaining, and sharing routine data
- Transportation project decision information assessment

Infrastructure Delivery
Environmental and Resources Information and Metrics

- **PHYSICAL ENVIRONMENT**
  - Geotechnical, Paleontology
  - Water Quality, Noise
  - Air Quality, Energy
  - Hazardous Waste
- **NATURAL ENVIRONMENT**
  - Biology, Wetlands
  - Wild and Scenic Rivers, Floodplain
  - Coastal Zone
- **CULTURAL RESOURCES**
  - Archaeology, Tribal Governments
  - Historic Properties
- **COMMUNITY ISSUES**
  - Land Use and Growth, Agricultural Lands
  - Business, Commerce, and Employment
  - Recreational Areas, Housing, and Neighborhoods
  - Visual/Aesthetics, Community Services
  - Public Safety

Infrastructure Delivery
Transportation Information and Metrics

- Mobility/Accessibility
- Reliability
- Safety
- System preservation
- Environmental quality
- Customer satisfaction
- Sustainability
- Cost-Effectiveness
- Economic well-being

Considerations to Determine Sufficiency of Information

- Communicated goals and objectives
- Relevant Information for decisions
- Appropriate level of detail
- Appropriate time frame
- Data value at plan/project stage
- Data quality required at stage

Framework to Determine Information Sufficiency

DATA VALUE AT PLAN/PROJECT STAGE: Critical, Moderate, or Low
DATA QUALITY REQUIRED AT STAGE: High, Medium, or Low

ANALYSIS AREAS	REGIONAL TRANSPORTATION PLAN	SYSTEM PLANNING (TCR, DSMP, Etc.)	PROJECT INITIATION DOCUMENT	ENVIRONMENTAL STUDIES	PROJECT DESIGN	CONSTRUCTION	OPPORTUNITY FOR BETTERMENT	CUMULATIVE IMPACT	PROJECT STOPPER
PHYSICAL ENVIRONMENT									
▪ Water Quality									
▪ Noise									
▪ Air Quality									
NATURAL ENVIRONMENT									
▪ Biology									
▪ Wetlands									
COMMUNITY ISSUE									
▪ Land Use and Growth									
▪ Agricultural Lands									
CULTURAL RESOURCES									
▪ Archeology									
▪ Tribal Governments									

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Environment
Common Partnering Issues

- **Different goals**
- **Resource sharing**
- **Information technology infrastructures**
- **Institutional barriers**

Congestion

- **Mobility performance measures**
- **Data and analysis issues**

“You get what you measure”

Mobility Performance Measures

- Key goal in most state transportation plans
- Many measures are from suppliers perspective
  e.g., V/C and LOS
- Desirable to reflect users perspective e.g., delay and reliability
- Difficult to set targets or standards due to inability to ensure outcome
- Data/analysis intensive
- Reaching consensus on definition of “mobility”

Examples of Mobility Performance Measures

- **Passenger or freight**
  - **Travel time/speed**
  - **Delay, congestion**
  - **Amount of travel**
  - **Reliability/variability**
  - **Modal splits**
  - **Connections/transfers**
  - **Facility access**
  - **Customer perception**
  - **Financial**

More Examples of Mobility Performance Measures

- **Freight specific**
  - **Roadway**
  - **Intermodal facilities**
- **Passenger specific**
  - **Multimodal**
    - Travel time, delay
    - Amount of travel
    - Modal comparisons
  - **Automobile/roadway**
  - **Transit**
  - **Non-motorized modes**

Mobility Measure Challenges

- State DOT's have little direct control over mobility
  - Economy, land use, personal preferences, specific modes
- System-wide aggregation does not lead to meaningful decisions
- State DOT may receive a bad report card
- Money and staff hours devoted to data collection

Data Challenges

- Defining and standardizing data
- Data quality, integrity, and currency
- Sharing and integration
- New data needs
- Data confidentiality concerns (e.g., freight)

Defining and Standardizing Data

- **“Know what you are measuring”**
- **Often a hierarchy of measures is needed to assess whether an agency goal is met or not e.g., MOBILITY = numerous data elements**
- **Data life – Important to know useful life of data to minimize extraneous data collection**

Defining and Standardizing Data (continued)

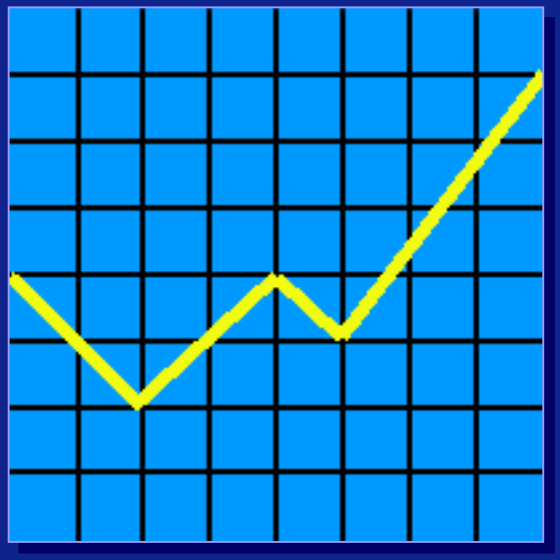
- Questions to be answered
  - Time interval?
  - Length of corridor?
- Standardization
  - Minimize subjectivity
  - Maximize objectivity
  - Need accuracy and repeatability

Defining and Standardizing Data (continued)

- **Modeling**
  - **Combination of modeled and collected data = desirable**
- **System wide versus corridor specific**
  - **Different data needs**
  - **System wide = indicators of condition and performance trend**
- **Takes a long time to refine data collection techniques, smooth data, and establish trends to obtain reliable results**

Data Quality and Integrity

- Currency (timeliness)
  - Agencies need guidelines to determine how often data is updated
- Consistency
  - Do two sources agree?
- Precision
- Sampling



Data Quality and Integrity (continued)

- Accuracy
  - Is it correct or not?
  - How good is good enough?
  - What is the cost/benefit of more data?
- Privatization
- Critical for data providers to make decision makers aware of data limitations and variability

Data Sharing and Integration

- Need to have clear common data definitions
- Location control systems must be compatible
- Need to be able to transfer data from legacy systems
- Need to overcome institutional issues
- Sharing must occur within an agency and among local, state, and federal agencies

New Data Needs

- New data needs stretch the budget allocated for routine existing data collection programs
- Data gaps emerge as number of measures increases e.g., need for freight and safety data

Data Questions

- Critical questions
  - Is data available?
  - Can we afford to collect it?
  - Are existing sources adequate?
  - Can data be analyzed and presented in a meaningful way?

Summary of Statewide Data Issues

- **Common data issues for all critical issues**
  - **Safety and Security**
  - **Environment**
  - **Transportation**
- **State DOTs data providers continue to make improvements to meet state and federal needs**

QUESTIONS?

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